Tricet Method to Increase the Hypertrophy Muscle

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Abstract. Tricet method of weight training is an exercise that involves using three types of tools to train one group muscle in the sequence order, but with different types of exercises for each set and without breaks between sets. Exercise with this method is able to provide maximum response to a group of muscles that are trained so that the potential for muscle development is more optimal. This paper investigates this method by giving a treatment in the form of weight training with the tricet method to be carried out 3 times a week, with exercise intensity of 70% to 80% or One Maximum Repetition (1RM), 3 sets, and 8-12 repetitions with the aim of increasing muscle hypertrophy. The results of the pre and post-test hypertrophy t-test analysis of arm, chest, thigh, and calf muscles in the experimental group showed a significant difference ($p < 0.05$). This investigation concluded that weight training based on the tricet method is able to increase hypertrophy over body large muscle.

1. Introduction

Exercise is a repetitive physical activities performed with the aim of increasing or maintaining individual physical fitness [1]. Exercise training is a process of improving an exercise ability that contains theory and practice, using methods and rules of implementation based on scientific approach, using the principles of planned and orderly education, so that the training objectives can be achieved on time [2]. The goals and objectives of exercise training in broad outline focus on improving basic physical quality in general. Within the context of improving the quality and psychic abilities of sportsmen in competitions, training is important in developing specific physical potential, perfecting the techniques, strategies, tactics, and play patterns. These goals and objectives will be achieved well if the exercise is carried out in accordance with the basic principles and components of the right exercise.

One of the exercises needed in fulfilling good physical fitness is weight training. Weight training is designed to increase muscle strength and endurance based on hypertrophy as the indicator. Hypertrophy is the process of increasing the size of an organ or tissue from the increase in size of its cells that are already there. Weight training can improve one's ability to

exert strength with the objective of increasing the strength, muscle endurance, hypertrophy, athlete's performance or a combination of these goals [3]. This can only be achieved through a planned and structured exercise that uses the right weight and gradually with the aim that the muscles develop stronger [4].

Weight training is widely used by fitness enthusiasts because weight training is an activity that can be achieved in a short time, but the with the dramatic change. [1] argued that weight training is a program designed to increase muscle strength and endurance through a series of progressive weight training that burdens the muscular system and causes physiological development. It is also called resistance training is one type of exercise that uses weights as a means to give movement to the body [5]. The advantages of weight training are numerous, including increased muscle strength and endurance, coordinated neuromuscular with higher bone density that will help to prevent osteoporosis. As for general health, weight training is a good activity for person with type 2 diabetes because the training improves heart condition by lowering blood pressure and drives positive effect to control cholesterol and lipoprotein levels [3].

Weight training is carried out using either the burden of one's own weight (internal load) or using the external weights such as dumbbells, barbells and machines. The types of equipment that can be used to perform weight training includes the free weights (barbell, dumlbell, and kettlebells), resistance bands, stability balls, or a combination of them. These media load tools support the training process with the aim of increasing fitness, muscle strength, speed, muscle tightening, muscle hypertrophy, rehabilitation, and weight gain and reduction.

In order to ensure that the training objectives can be achieved, weight training must be properly guided and executed. One of the things that need to be done is to pick the right weight training method. There are several weight training methods that can be used, namely: the super set method, compound set, tricet, giant set, pyramide system, and drop set [6]. Super set is a weight training method where a person does two exercises to train opposing muscle groups and is carried out in succession without resting among them, such as for the super set of arms which is a set of bicep curl exercises followed by a set of pushdown tricep exercises. The compound set training method is similar to the super set training method in pairs with two exercises that are repeated over and over in the same muscle group. Nonetheless, [6] argued that the tricet training method uses three exercises for the same muscle group repeatedly without breaks between sets, compared to compound sets of only two exercises. The giant set training method is similar to compound sets and tricet exercises in several exercises carried out for one muscle group repeatedly without breaks between sets.

According to [7], there are three versions of the weight training method with the pyramid system; (1) by increasing the weight of the load and reducing repetition, (2) by increasing repetition and reducing the weight of the load, and (3) by increasing the weight of the load and repetition. The pyramid method is one of the strength training systems that is considered to have the best effect in increasing strength [8]. [7] stated that a drop set is an exercise carried out as an extension of the initial set of exercises where the load lift is determined by the number of repetitions to the point of relative failure, lowering the load, and the lifter completing the number of sets and reps until they fail.

Choosing the right training method can also affect the achievement of weight training programs. One training method that can provide potential for muscle development is the tricet method, where weight training using the tricet method is an exercise by doing three types of tools to train one and the same muscle group in a row, but with different types of exercises for each set and without breaks between sets. This tricet method emphasizes weight training with the function of introducing the same group of muscles using different tools. Exercises with this system can provide a maximum response to a group of muscles that are trained so that the potential for muscle development is more optimal.

This paper is set to investigate the tricet method for weight training with the aim to measure

the hypertrophy of the arm, chest, thigh and calf muscles. The remainder of this paper is organized as follows. Section 2 presents the tricet method to weight lighting, Section 3 presents the results, Section 4 discusses the results, and finally Section 5 concludes the paper.

2. Methods

This study used an experimental method with the pre-test and post-test control group design. The treatment is in the form of weight training with the tricet methods. The tricet method is weight training carried out using three tools to train the same muscle group and is performed repetitively without breaks between sets. The frequency of the exercise is in the form of 3 times per week, with the intensity of 70% to 80% One Maximum Repetition (1RM). There are in total of 3 sets with 8-12 times repetitions. This treatment is expected to give effect to muscle hypertrophy through the mass addition muscles in a large group of muscles including the arm, chest, thigh, and calf muscles shown. The increase of muscle sizes will be measured using the tape measure based on the circumference of the arm, chest, thighs, and calves in units of centimeters.

The population used in this study is the students registered for the IKOR of FIK UNY programme with the size of 20 male students. The sample was divided into two groups; treatment group and control group. The normality test was used as data analysis technique data to determine whether the data has a normal distribution. Variant homogeneity test was used to test the variance of data in the experimental group. As for hypothesis testing, the Independent Sample t-test was used. The experiment is to test the hypothesis H1 as follows.

H1: There is a significant effect of weight training with the tricet method on the increase in muscle mass of the arm, chest, thigh and calf.

Hypothesis testing for H1 was made on the post-test data from the treatment group and compared to the control group. Before testing the hypotheses, a test of data equality was carried out, namely the t test on the pre-test data to find out if the initial abilities among the students are at the same level.

3. Results

The data equality test was conducted to show that the initial conditions between the treatment groups and the control group were the same, so that if there was a change in the treatment group at the time of the post-test it will be recorded effect of the treatment given. The results of t-test analysis of arm muscle pre-test data obtained t value of 0.129 with a significance value of 0.898 which is greater than 0.05 ($p > 0.05$), so that it can be interpreted that the arm muscle pre-test data in the treatment group and control is the same. In the chest muscle pre-test data, the value of t count is 0.851 with a significance value of 0.406 which is greater than 0.05 ($p > 0.05$), which means that the chest muscle pre-test data in the treatment and control groups are the same. The results of the t-test analysis of the pre-test data obtained t count value of 0.191 with a significance value of 0.851 which is greater than 0.05 ($p > 0.05$) which means that the thigh muscle pre-test data of the treatment and control groups are the same. Furthermore, it is also seen in the calf muscle pre-test data, the value of t count is 0.558 with a significance value of 0.584 which is greater than 0.05 ($p > 0.05$) which means that the calf muscle pre-test data in the treatment and control groups is the same. The results of t test for the pre-test adata are shown in Table 1.

The results of the t-test analysis for muscle post-test showed that the t-count value is 3.632 with a significance value of 0.002 which is smaller than 0.05, therefore it can be concluded that there is a significant effect of weight training with the tricet method on arm muscle hypertrophy. The t-count value is 2.417 with a significance value of 0.026 ($p < 0.05$), so there is a significant effect of weight training with the tricet method on chest muscle hypertrophy. There is a significant effect of weight training by the tricet method on thigh muscle hypertrophy based

Table 1. *T*-Test Result of Pre-Test Muscle

Data	Test	Mean	*t*-test	Significance	Results
Arm Muscle	Treatment	29.70	0.129	0.898	Significant
	Control	29.80			
Chest Muscle	Treatment	87.00	0.851	0.406	Significant
	Control	88.30			
Thigh Muscle	Treatment	51.50	0.191	0.851	Significant
	Control	51.30			
Calf Muscle	Treatment	34.70	0.558	0.584	Significant
	Control	34.30			

on the t-count value of 2.253 with a significance value of 0.037 which is smaller than 0.05. There was a significant effect of weight training with the tricet method on calf muscle hypertrophy based on the t-count value of 2.854 with a significance value of 0.011 ($p < 0.05$). The results of t test for the pre-test adata are shown in Table 2.

Table 2. *T*-Test Result of Post-Test Muscle

Data	Test	Mean	*t*-test	Significance	Results
Arm Muscle	Treatment	32.00	3.632	0.002	Significant
	Control	29.70			
Chest Muscle	Treatment	90.40	2.417	0.026	Significant
	Control	87.60			
Thigh Muscle	Treatment	54.10	2.253	0.027	Significant
	Control	51.90			
Calf Muscle	Treatment	36.90	2.854	0.011	Significant
	Control	35.10			

4. Discussions

Muscle hypertrophy is the process to increase the size or muscle mass by increasing the number of actin filaments and myosin in each muscle fiber, hence causing an increase in existing muscle fibers that have existed since birth [9]. During hypertrophy, muscle contractile protein synthesis takes place faster than its destruction, resulting in an increase number of actin and myosin filaments in myofibrils. Myofibril is a smooth protein actin and myosin in the fiber increases so as to make larger fibers. The collective effect of increasing magnitude in each fiber is the cause of changes in muscle size seen. Myofibrils themselves will break down in muscle fibers to form new myofibrils, hence muscle hypertrophy. Strong muscle activity and exceeding excitatory thresholds will cause increased muscle size, a phenomenon of muscle hypertrophy. The midline of each muscle fiber increases, the amount of fibers and the need for various nutrients and substances between metabolism increases. In short muscle hypertrophy increases the power of motion and nutrient mechanism to maintain increased motion. Muscle hypertrophy occurs mainly as a very strong muscle activity even though the activity is only a few minutes per day.

A body of research shows that metabolic stress induced by exercise serves as a strong hypertrophic stimulus [10]. The resistance training induce metabolic stress based on the performance of anaerobic glycolysis during the production of adenosine triphosphate. This results in the accumulation of intramuscular metabolites, which is believed to have positive changes in the anabolic environment along with the combination of hormonal factors such as the growth hormone (GH), testosterone, cellular hydration, free radical production, as well as

growth-oriented transcription factor activity [11]. Low pH is associated with rapid glycolysis stimulates sympathetic nerve activity and increases fiber degradation [12].

Some physiologists viewed muscle enlargement is caused by the extent of muscle fibers due to an exercise. It can be said that adding muscle mass occurs due to the growth of muscle mass where the muscle fibers increase in size or thickness due to exercise. Recruitment of maximal muscle fibers occurs when all of the muscle fibers that are trained are completely used to move the pressure of the load placed on that part of the muscle. Recruitment of maximal muscle fibers must occur to be able to get maximum muscle growth. Without the recruitment of all muscle fibers in the part of the body being trained, the muscle developed will be only a small amount of muscle fibers used. This means the more muscle fibers recruited during the training session, the greater the potential for hypertrophy.

One of the goals of weight training is to increase the size of the muscle fibers or muscle hypertrophy. Hypertrophy will occur after exercise for 8 weeks or more, so that the size of the muscle will be visible. An exercise program using weight from outside the body (weight training) will accelerate the process of muscle hypertrophy [2]. The occurrence of muscle hypertrophy is a direct result of increasing the number of myofibrils in each muscle fiber, increasing the density of capillaries in each muscle fiber, increasing the amount of protein, and increasing the number of muscle fibers [13]. So to increase muscle mass in the form of addition / development of muscle mass should be done with weight training with a system of loading from the outside, because with this system the muscles will be more aroused so that the development of muscle mass can be optimal.

Weight training is effective in stimulating muscle hypertrophy and increase strength due to its acute exercise such as the type and sequence of exercises, the intensity, volume, duration, frequency, as well as the rest interval. These variables can be controlled in order to get difference results from mechanical and metabolic pressure. For example, when the intensity of exercise resistance increases, twitching rate of muscle fibers will also increase, hence increasing the mechanical pressure. (Henneman et al. 1965). Another example is by [14], whereby high number of repetitions together with the use of short rest intervals programs will induce greater metabolic stress. Due to this reaction, resistance training is used to target the increase if metabolic rate through different sets of rest interval between sets.

Weight training using the tricet method is done using three different tools to train a group of the same muscle and do it repeatedly without resting between sets. Weight training with the tricet method is done 3 times a week, the intensity of exercise 70-80% from 1RM, as many as 3 sets, and 8-12 times repetition can increase muscle hypertrophy. This can be seen based on the results of the t-test analysis of the arm muscles, chest muscles, thigh muscles, and calf muscles obtained as a whole smaller than 0.05 ($p < 0.05$). The American College of Sports Medicine recommends lifting weights of at least 65% of 1 maximum repetition (1RM) for 6-12 repetitions to achieve muscle hypertrophy under normal conditions. The literature has shown that lifting below this intensity does not contribute to hypertrophy. Some researchers say that progressive resistance training can significantly increase muscle size. Enlargement in the cross-sectional area of the muscle (CSA) of around 10-15% has been reported after 1014 weeks of dynamic heavy resistance training [15]. Muscle hypertrophy is limited during the early weeks of training, with the majority of increased strength in untrained individuals associated with nerve and muscle structure adaptation [16].

5. Conclusions

This paper has demonstrated the application of tricet method for weight training by using three different tools to train the same group of muscles. The training was conducted repeatedly without resting between sets. Weight training with the tricet method was carried out three times a week, with the intensity of exercise at 70% to 80% for One Repetition Maximum (1RM), as

many as 3 sets, and 8-12 times repetition to increase muscle hypertrophy. This can be seen based on the results of the t-test analysis of the arm muscles, chest muscles, thigh muscles, and calf muscles obtained as a whole was smaller than 0.05 ($p < 0.05$).

Acknowledgements
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